

*REMARKS*

SUMMARY

Claims 1-21 and 23-91 remain pending in the Application. Claims 1-16, 27-68 and 75-91 stand withdrawn as a result of a Restriction Requirement. The indication of allowability of claims 20, 25 and 74, at page 7 of the previous Office Action, and the reiteration of allowability at page 6 of the present Office Action are noted with appreciation. Claims 20, 25, and 74 were previously amended, in a Response filed on April 7, 2008 to the previous Office Action, to include all limitations of the base claim and intervening claims from which they depend, and are thus believed to be in condition for allowance. None of the claims are amended herein in traversing the present Office Action.

CLAIM REJECTIONS UNDER 35 USC § 103

**The rejection of claims 17-19, 21, 23, 24, 26 and 69-73 as being obvious over Birkhead (US 6,536,522) in view of Pavlov (US 6,683,428), as stated on pages 2-5 of the present Office Action, is traversed.**

Simply stated, the combination of Birkhead and Pavlov does not teach or suggest all limitations of the claims of the present Application, and does not, therefore serve to meet the Examiner's burden of establishing a prime facie case of obviousness. Furthermore, the combination of Birkhead and Pavlov teaches away from the present invention.

Claim 17, and claims 18, 19, 21, 23, 24, 26 depending from claim 17, all require, *inter alia*, determining values of torque and speed inputs to a progressing cavity pump coupled to an electric motor, by measuring electrical voltages applied to the motor and currents drawn by the motor, and using the measured values of electrical voltages applied to the motor and currents drawn by the motor to calculate the values of torque and speed inputs to the progressing cavity pump.

As admitted at page 4 of the present Office Action, Birkhead does not teach or suggest the above stated express limitation that the torque and speed inputs to the progressing cavity pump must be calculated from measured values of voltage applied to and current drawn by a motor driving the progressing cavity pump. As further admitted by the Examiner at page 4, Birkhead teaches the use of a torque and speed sensor 80 as the sole means and method for directly sensing the speed and torque of the motor 10 and

reporting these values as an input signal (over motor input signal line 20) back to the controller 25 of Birkhead. *See, Birkhead, col. 4, ln. 21-23; col. 5, ln. 14-25.*

Claim 17 of the present Application, and claims 18, 19, 21, 23, 24 and 26 depending from claim 17, also all require, in combination with the limitation addressed above, that ***one or more values representing the performance of the progressing cavity pump must be found through calculation from the values of torque and speed inputs to the progressing cavity pump, as calculated from measurements of electrical voltages and currents applied to and drawn by the motor.*** Birkhead does not teach or suggest this limitation, and in fact expressly teaches away from this limitation by disclosing that pump performance parameters are determined directly only through the use of a series of pressure sensors 37, 50a and 50b. *See, Birkhead, col. 4, ln. 28 through col. 5, ln. 12.* As stated in the present Application, the ability to determine performance parameters of the progressing cavity pump, such as pressure, flow and fluid level without the use of sensors as taught and suggested by Birkhead is a substantial advantage provided by the present invention.

Claim 17 of the present application, and claims 18, 19, 21, 23, 24 and 26 depending from claim 17 all further require that ***one or more command signals be produced using the progressing cavity pump performance values that were found through calculation from the values of torque and speed inputs to the progressing cavity pump, as calculated from measurements of electrical voltages and currents supplied to and drawn by the motor.*** As was the case with the other limitations discussed above, Birkhead does not teach or suggest this limitation, and expressly teaches away from this limitation by disclosing that pump performance parameters are determined directly solely through the use of the series of pressure sensors 37, 50a and 50b. *Id.*

Combining Pavlov with Birkhead does not overcome all of the deficiencies of Birkhead in not teaching or suggesting the limitations of claim 17, or of claims 18, 19, 21, 23, 24 and 26 depending from claim 17, as discussed above. As stated at page 4 of the Office Action, the Examiner cites Pavlov as teaching a control method for a motor including measuring voltages and currents of the motor in using the measured values of voltage and current calculate values for motor speed and torque. As such, the Examiner asserts that the method taught by Pavlov can be substituted for the sensor 80 of Birkhead.

In general, the Applicants agree with the Examiner that it might have been obvious to substitute the method of Pavlov for the direct speed sensor of Birkhead, in the manner

suggested by the Examiner. The combination of Pavlov and Birckhead does not, however, teach or suggest all limitations of any claims of the present application. In fact, the teachings of Birckhead and Pavlov standing alone, or in combination, and the Examiner's rationale in suggesting the combination, all serve as evidence directly teaching away from the present invention. In direct contrast to doing what might have been obvious, i.e. using the pressure sensors of Birckhead sensor for directly measuring pressures generated by the progressing cavity pump, in combination with the method and apparatus of Pavlov, the present invention eliminates the need for such sensors or direct measurement through novel utilization of the voltage and amperage at the motor, for determining the performance of the progressing cavity pump. In the present invention, therefore, the functions performed by separate sensors in Birckhead are retained despite the elimination of the need for the sensors. *See MPEP § 2144.04 II.B "omission of an element with retention of the element's function is an indicia of unobviousness."*

Even assuming *arguendo* that the combination of Pavlov with Birckhead in the manner suggested by the Examiner is correct, and that the method of Pavlov could be used in place of the sensor 80 of Birckhead, the combination of Birckhead and Pavlov still do not teach the other limitations of claims 17, 18, 19, 21, 23, 24 or 26 requiring that values representing the performance of the progressing cavity pump must be found from the calculated values of torque and speed. Stated another way, the combination of Pavlov with Birckhead would result in the system of Birckhead, which determines performance of the progressing cavity pump and controls the progressing cavity pump on the basis of inputs measured directly through pressure sensors 37, 50a and 50b, in combination with the method of Pavlov being used only for a feedback signal to the controller 25 of Birckhead being provided along motor input line 20 of Birckhead in accordance with the disclosure at col. 5, lns. 13-25 of Birckhead. Contrary to the Examiner's assertions, at pages 2-5 of the Office Action, therefore, there are no teachings or suggestions in the combination of Birckhead with Pavlov for replacing the pressure sensors 37, 50a and 50b and methods of Birckhead with the methods and apparatus of the present invention in which the functionality of those sensors of Birckhead and More is provided without the use of sensors by determining performance of the progressing cavity pump solely from the voltage and current applied to the motor driving the progressive cavity pump without the use of any pressure sensors, and particularly without the use of the downhole pressure sensors 50a, 50b required by the combination of Birckhead and Pavlov.

Claim 69, and claims 70-72 depending from claim 69, require an apparatus for carrying out the method discussed above with regard to claim 17 and claims 18, 19, 21,

23, 24 and 26 depending from claim 17. Such an apparatus must include, *inter alia*, means for using values of torque and speed inputs to a progressing cavity pump determined by measuring electrical voltages and currents supplied to a motor driving the progressing cavity pump, for calculating one or more values representing the performance of progressing cavity pump, and means for using the progressing cavity pump performance values to produce one or more command signals for controlling the speed of the progressing cavity pump. As described in detail above, with regard to traversal of the rejection of claims 17 and the claims depending from claim 17, the combination of Birkhead and Pavlov does not teach or suggest all of these limitations, and cannot therefore render obvious claim 69, or claims 70-72 depending from claim 69.

Claim 19 depending from claim 17, and claims 70-72, depending from claim 69, all require, *inter alia*, the limitations discussed above with regard to traversing the rejection of claims 17 and 69 under 35 USC § 103. As discussed above, the combination of Birkhead and Pavlov does not teach or suggest all limitations of base claims 17 and 69, and therefore cannot render obvious either claim 17 or 69, or any claim depending therefrom. *See MPEP 2143, basic requirements of a prima facie case of obviousness require that the prior art reference must teach or suggest all the claim limitations. MPEP 2143.03, citing In re Fine, 837 F.2d 1071 (Fed. Cir. 1988) (if an independent claim is non-obviousness under 35 USC 103, then any claim depending therefrom is non-obvious).*

**The rejection of claim 73, as being obvious over Birkhead and Pavlov in view of Kawabata (US 6,244,831), is traversed.**

Claim 73 depends from claim 69. As discussed above, with regard to traversal of the rejections under 35 USC § 103, the combination of Birkhead and Pavlov does not, contrary to the Examiner's assertion bridging pages 5 and 6 of the Office Action, disclose all of the limitations of claim 73 except means using the progressing cavity pump performance values to produce command signals through use of a feed forward signal. The Examiner correctly makes no assertion that Kawabata teaches or suggests the limitations of claim 69, or claim 73, for which the Examiner relies upon Birkhead and Pavlov. Therefore, the combination of Birkhead, Pavlov and Kawabata cannot render claim 73 obvious.

## CONCLUSION

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If in the opinion of

In re Appln. Of: Thomas L. Beck et al.  
Application No.: 10/655,778

the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

#### PROCEDURAL MATTERS AND FEES

The Commissioner is hereby authorized to charge the fee for an automatic two month extension of the time for response, to deposit account number 50-3505. Applicants believe that no other fees or overpayments are occasioned by the submittal of this paper. If any other fees or overpayments are occasioned by the filing of this paper, however, the Commissioner is authorized to charge those fees, or credit any overpayments to deposit account 50-3505.

Respectfully submitted,

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